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Agricultural Education in New York.

THE Experiment Station Extension Law, usually called the Nixon Bill, under which the foundation has been laid of what promises to become an established system of agricultural education in the state of New York, was originally enacted in the interest of the grape growers of Chautauqua County. These men four years ago asked Professor Bailey, as the horticulturist of Cornell Experiment Station, to help them in fertilizing and caring for their vineyards. Of course, he could not undertake to supply expensive plant-food for any one section of the state, for, even if he had sufficient funds at command, other sections would make similar application. The station, however, offered to supervise any experiments which the local horticultural society might undertake, and later on Mr. Lodeman went into the district and outlined some experimental work to be carried on. The people became so thoroughly interested in this work that they made application to the Legislature for a small grant of money to be used for prosecuting it in Chautauqua County vineyards. It was evident, however, that this work, if useful at all, ought to be undertaken on a wider scale, and therefore a grant was made applicable to the Fifth Judicial Department of the state, which included sixteen counties in western New York. A sum of $8,000 was given to the station to be used "in conducting investigations and experiments in horticulture; discovering and remedying diseases of plants, vines and fruit-trees; in ascertaining the best means for fertilizing vineyards, fruit and garden plantations; in disseminating horticultural knowledge, and in preparing and printing for free distribution the results of such investigation, with such other information as may be deemed profitable in promoting the horticultural interests of the state."

This grant, requested by people of the Legislature of the state, was the first instance, so far as we know, where a farming community definitely demanded the means of extending experimental and scientific knowledge in agriculture; and although the promoters of the scheme did not, perhaps, see its ultimate meaning, it marked a long step forward. In the absence of the Director of the Station, Professor Roberts, and of his assistant, Mr. Lodeman, the responsibility of outlining and carrying this new work rested entirely upon Professor Bailey, who had no precedents to guide him in using the money. The first year's work was mainly preparatory and was spent in the effort to find out what people needed and what they wanted. Many meetings were held and bulletins published, and at the end of the year a definite conception had been formed of what could be accomplished. This was in 1894, and Professor Bailey estimates that the actual travel in western New York, in pursuance of this bill, was something like 20,000 miles. In the winter of 1895 the people requested the Legislature to increase the grant to $16,000, which was at once acceded to. This year the work was extended, and a special study was made to determine the actual economic status of the farmer and the remedies for his needs. Besides this inquiry, new experimental work was laid out, many meetings were held, short-session horticultural schools were established in various towns and many more bulletins were published.

In January of 1896 the Legislature was again asked for $16,000, and the appropriation was granted with great unanimity. The marked feature of the enterprise this year was an effort to apply the stimulus of a distinct educational motive to rural communities—that is, to arouse farmers to an appreciation of what had become an evident truth, that education is the real cure of the trouble and distress in our agricultural communities. The work of Professor Bailey and his assistants, together with their bulletins, had proved that the people need teaching more than they need experimenting, and the work was extended to the rural schools. Here was another new departure, and Professor Bailey testifies that of all the work he has ever undertaken nothing has ever inspired him or his assistants with such enthusiasm, and when they visited rural schools and began to interest teachers and pupils in the common objects about them the awakening of their mental activity was an unfailing surprise. If there is to be any revival, any beginning of new life to agriculture, here is where it must originate. The best work now going on, therefore, is the endeavor to interest teachers of public schools in nature study, and it is gratifying to learn that the leaflets, of which we have heretofore spoken and which are novel of their kind, have been received with the greatest favor throughout the state, and, indeed, everywhere else. This idea of carrying the study of nature directly into rural communities is the most promising development in the field of agriculture since the experiment stations were established. In January of the present year the people again went to the Legislature and a distinctly new bill was passed. Hitherto the money had been granted to a portion of the state and in the interest of horticulture only. Now the demand came for a bill to apply to the entire state and to the whole field of agriculture, and $25,000 was asked to begin the work. This, too, was plainly a popular movement, and it passed without any opposition. The work now naturally falls into the hands of the Director of the Station, Professor Roberts, who has had a general supervisory direction of it after the first year. While it was limited to the field of horticulture under the original Nixon Bill, forty-nine bulletins were issued, and the farmers of the state seem to be awakened to avail themselves of the power to bring the agricultural college into direct communication with the rural communities. They show their appreciation of the situation by their demands before the Legislature, and the strength and sincerity of their desire is proved by the readiness with which the Legislature accedes to their petitions.

From time to time we have spoken of this movement as its various phases developed. We have given some account of the itinerant or local experiment work of the expository bulletins as distinct from those which record strictly scientific work, of the striking success of the horticultural schools, and especially of the observation lessons which have been uniformly one of the school exercises. In these observation lessons some small object or part of a plant, like leaves or roots, or flowers or seeds, are put into the hands of all the audience, and after a short

time is allowed for examination they are questioned by the instructor until they realize how much there is to be learned by a careful examination of any natural object and how to use their faculties in the way of discovery. We have also spoken of the elementary instruction in rural schools which has been encouraged by the leaflets recently devised, and we may add now that one of the latest plans is a course of reading which has been devised in such a way as to compel the readers to think. About sixteen hundred persons are now reading systematically, although the plan is but a few months old. The station officers specify certain bulletins which are to be read, and then they ask the readers questions upon them, and in this way they are compelled to do some thinking, whether they wish to or not. Subjects within the farmers' comprehension are always selected. The first subject of study was the soil, and two bulletins were prepared, one on its texture and the other on the moisture it contained, and readers were requested to note anything upon which they needed more light or any statement which they wished to challenge, and were invited to send their queries and opinions to the station after they had thought them over carefully. But, not content with this, specific inquiries were addressed to every reader on both of these subjects, and the questions were so searching that no one could reply to them without some active use of his faculties.

Bulletin 122, published last December, the second annual report of this extension work, describes with considerable detail this experiment, for, of course, it is still an experiment. Nevertheless, every advance has been made with such caution and foresight that one cannot help feeling confident that the scheme, taken altogether, has expanded on most efficient lines. The recommendations in the concluding paragraph will commend themselves to every one. The several agencies which we have named should all be under the direction of a single bureau, removed from partisan influence, and associated with the original investigations in agriculture. This bureau ought to have an intimate connection with the Department of Public Instruction, so as to reach teachers, and through them the schools. Teachers in normal schools should be trained by experts in rural subjects. At the conclusion of this bulletin Professor Bailey notes as a matter to be thought of with astonishment how scant and poor has been the teaching hitherto which has had even a remote relation to the tilling of the soil. Many of our rural books do not seem to have been born of any real sympathy with the farmer or any just appreciation of his environment. It is a significant fact that the farmers of this state, as a whole, have proved themselves willing and anxious to be educated. They are difficult to reach, not because they are unwilling to learn, but because they have not been well taught.

We have received another letter from Dr. Augustine Henry, of the Chinese Customs Service, in which he mentions a remarkable excursion into the basin of the Red River in China. No doubt, Dr. Henry will, at some future time, give a more complete narrative of this tour through an unknown country, and publish the details of his discoveries. This brief account of the journey, however, is so interesting that we present it to our readers:

I have just returned from an exceedingly interesting trip to the country south of the Red River, in a district ruled over by an hereditary chief, who received me with great kindness. I reached the great range separating the Red River basin from the Black River basin, densely wooded with very large trees (average twenty feet in circumference at six feet from the ground), and toward the ridge, where the trees cease, an impenetrable Bamboo jungle, so that the range is only to be crossed at distant points by passes. The range averages 8,000 feet to 10,000 feet high. As this is the dead-point of the year as regards vegetable life, there was not much out in flower, but I found a magnificent Rhododendron, a Magnolia, two or three Camellias, Stuartia, Daphne (Indica?), a shrub with deliciously scented white flowers, an alpine Primula, two or three Clematis, an Evonymus with remarkably durable and strong wood, occurring on the range. Two or three large Aralias (or kindred genus) occur right up to the summit. A very common tree was the Tetracentron Sinense, Oliver. This tree is very large, indeed, but the wood is not esteemed. Its fruit-spikes were lying scattered all over the forests, and most of the seed fallen. However, I secured a few seeds, which I enclose in this note. The tree is of interest from its position in the family Trochodendraceæ.

I spent two days on the Red River, where a tropical vegetation exists, and I found the Tomato and Carica papaya naturalized and growing abundantly. I found some interesting plants there also. The most marked peculiarity is the bizarreness of the fruits. One tree has pods two or three feet long clothed with a dense covering of brown hair, like the tail of an animal. The Tamarind, Raphis, the Banana were all there in the wild state. I forgot to mention that immense evergreen Oaks occur in the mountain forests.

However, the most interesting point of the journey was the aborigines. In the chief's district, say, a region twenty miles square, in addition to Chinese settlers, no less than seven distinct tribes dwell—distinct, that is, in physiognomy—with language mutually unintelligible, never intermarrying and having little or no social intercourse with each other, and possibly existing in this state for centuries. I collected vocabularies of their speeches, and they divide into three groups—Lolo, Meaotze and Shan. The languages are all of the Chinese type, monosyllabic—that is, non-inflectional, with tones—and the peoples are Mongolic; but behind their Mongolian origin is strong evidence of two other stocks: (a) a pigmy and exprimitive race, and (b) a negro element, characterized by the receding forehead and thick lips and occasional woolly hair. One people has extremely swarthy skins.

I found the Lolos proper in possession of a written character, in daily use, which seems to be an offshoot from very ancient Chinese (A. D. 1).

So you see how interesting, from many points, this region is. Great red deer and large and small bears occur in the forest, as evidenced by their numerous tracks, and many of the trees were marked by the claws of the smaller bear, who builds a kind of nest in the trees to sleep in.

John Evans and his Garden.

Few persons of the present generation know of the existence of a neglected garden ten miles west of Philadelphia, which in the early days rivaled the gardens of John Bartram at Kingsess, and of Humphrey Marshall at Marshallton. Since the reawakened interest in Bartram's garden, it is surprising that the garden of John Evans should so completely be lost sight of. Situated in a beautiful country devoted to farming and summer residences of rich Philadelphians, and about three-quarters of a mile from Wootton, the celebrated demesne of the late George W. Childs in the famous Welsh Tract, it is still a charming place to visit, although its glory has departed.

John Evans was born in Radnor township, Delaware County, February 13th, 1790, and died on the 15th of April, 1862. He was the son of David and Adah Evans. On the paternal side his ancestors were thoroughly Welsh, while on that of his mother they were partly so. His early education was limited, though he received rather more than was usual at that time. There was a mill on the patrimonial estate, but he preferred going to a larger establishment to learn the business of milling, and after he had learned it thoroughly he was employed as manager of a larger flour mill, then (1812) recently erected near the present city of Troy, New York.

After his return from Troy he resumed the milling business at the homestead mill, and in 1819 married Ann, the daughter of Benjamin Brown, of Radnor, by whom he had six children. He subsequently engaged in the business of sawing lumber for the Philadelphia market.

Up to about the year 1827 or 1828, John Evans had not shown a great preference for any particular branch of science. About this time he received a visit from his kinsman, Alan W. Corson, of Plymouth, Montgomery County, who had with him a copy of Dr. William Darlington's *Florula Cestrica*, then lately published, and he became from that day an ardent botanist. His kinsman, Corson, and he

took frequent excursions together into the woods and fields. Annual or more frequent visits were paid to the old Bartram botanic garden—then in the possession of Colonel Carr—and to other gardens in the vicinity of Philadelphia. He gathered everything interesting and rare to transplant until the supply from this source was exhausted, when he turned his attention to Europe and entered into correspondence with Sir William J. Hooker, director of the garden at Kew, and by forwarding to that learned botanist annually for many years seeds and specimens of American plants, frequently obtained by long journeys and much labor, he received in return new and often rare plants from various parts of the world, scarcely obtainable from any other source by purchase. During part of the period occupied by this correspondence, Dr. Joseph Hooker, the son of Sir William, made a botanical tour to the Himalaya Mountains, in Asia. Seeds from that almost unexplored region, many of them produced by unknown plants, were forwarded to John Evans, who bestowed a great amount of care and labor upon the propagation of plants from these seeds. He also had a correspondent in Germany.

The premises of John Evans afforded no suitable grounds for an extensive garden specially designed for show and ornament, and yet it is doubtful whether another spot of the same extent contained a greater variety of plants of every habit, and every plant was found in the best place for its propagation and growth.* On the densely wooded hillside along the mill-race, north of the dwelling, were found magnificent Rhododendrons and other mountain plants, natives of the Himalayas, the Rocky Mountains, the Adirondacks, the Catskills and the Allegnanies, growing side by side in shaded seclusion, and moistened by the spray from the adjacent cascade of the mill-pond. Below, upon a flat on the opposite side of Ithan Creek, was an arenaceous alluvial deposit. Here was found the well-known "sand garden" of John Evans, and clustered within it a great number of species from New Jersey and many strangers from similar soil in more remote regions. The arid, rocky hills were covered with Pines and other conifers. The damp, shaded ravine had its Canebrake, the artificial pond its odoriferous Water-lilies and other aquatics, and every border and every corner were occupied by appropriate specimens brought together from remote parts of the earth. A large proportion of the labor required for the care and cultivation of this great collection was performed by the hands of its owner. The sawdust from his mill was used extensively around the growing plants to smother weeds. This soon decayed into a rich mold that promoted the growth of the plant.

The extent of the Evans collection is not accurately known, as no catalogue was ever published. In the number of distinct species of trees and shrubs it was doubtless unrivaled in his day, while in herbaceous plants it had few equals.

The garden at the present day is in a good state of preservation, although many changes have been wrought in the buildings and their surroundings. The mill has been torn down and the house altered to suit the tastes of the present owner. A splendid specimen of Cephalotaxus Fortunei stands back of the house along the mill-race, associated with several large Box-trees and Yews. A well-grown Cryptomeria also attests to the variety of arborescent species in former days. Daphne Mezereum is abundant as an undershrub in some parts of the wooded tract, while the Periwinkle (Vinca) covers the ground in many places. An interesting variety of the English Ivy growing against a stone wall along the driveway leading up to the house is peculiar in that the terminal leaders have an upright, independent habit with triangular or deltoid leaves, and provided abundantly with fruit. Several Magnolias on the lawn are of good size. The Rhododendron thicket in the woods back of the house along the mill-race is still in good preservation, although when a visit was paid to the garden it was too early to judge of the botanical richness of the species. Nothing remains to indicate the location of the "sand garden" except one or two specimens of Yucca filamentosa. That the garden was formerly rich in species is proven by the fact that in the herbarium of the University of Pennsylvania many specimens from the garden are preserved, showing the former richness of its flora fostered by the hands of John Evans.

With John Bartram and Humphrey Marshall, John Evans completes a trio of self-taught botanists, all born within the limits of old Chester County, Pennsylvania, and the first within the present county of Delaware, which was partitioned off from the original Chester County. They were men of like tastes and were alike in their industrious and frugal habits. They were all men of the strictest integrity and highest moral worth, and especially were they devoted students of the vegetable kingdom. Each reared his own monument in the large collection of growing plants he left behind him.

University of Pennsylvania. *John W. Harshberger.*

* The garden is best reached at present by alighting from train at Rosemont, Pennsylvania, on the Pennsylvania Railroad, and taking Robert's Road to Ithan Creek; the present owner is William H. Ramsey.

Three West-American Conifers.

SEVERAL so-called marked varieties of our western conifers, I am convinced, are entitled to take rank as species. Crowding two or more marked forms into one polymorphous group, while it emphasizes the fact that they are related, gives us little other knowledge of them. We know in this age of the world that all groups of plants are connected, more or less closely, and we believe that they are all derived from a few simple, primordial forms. As we meet with the termini of these lines of development we find them greatly diversified while also retaining vestiges of kinship. We advance knowledge of these lines—these genera and species—more by detecting and separating than by ignoring and generalizing.

Prevalence of the following forms over large forest areas, combined with many conspicuous differences, both in habitat and structure, demands, in my opinion, this long-delayed recognition.

PINUS SCOPULORUM, nom nov.*—Rocky Mountain Yellow Pine. Small trees, rarely exceeding a hundred feet in height and four in diameter, spire-shaped in outline, the grayish bark thinner and harder, the sapwood thicker and the cones smaller, and with firmer, darker scales than in the typical P. ponderosa. Foliage thinner, more inclined to be tufted at the ends of the branchlets, leaves usually in threes, but often in twos.

Sparsely distributed on the high slopes and plateaus of the Rocky Mountains, from British Columbia southward through Montana, Idaho, Wyoming and Colorado to northern New Mexico, and eastward to the Black Hills of North Dakota and Nebraska.

The "polymorphous" Pinus ponderosa, with headquarters in the Sierra Nevada of California, and extending along on the western ranges northward through Oregon to Washington, and southward through Arizona to Sonora, probably contains several more forms marked enough to rank as species—notably the "Brown-bark Pine" (my variety nigricans)—forming almost exclusively a large forest on the great Colorado plateau of central Arizona and New Mexico.

PICEA COLUMBIANA, nom nov.†—Trees usually small and slender, rarely exceeding seventy-five feet in height, with a diameter of three feet. Bark light-colored, thin, hard and flaky; branches short, especially those on the upper half or two-thirds of the trunk, rendering the tree spire-like in out-

* Pinus ponderosa, var. scopulorum, Engelmann in Brewer & Watson *Bot. Cal.*, ii., 126 (1880). Sargent in Xth U. S. Census, *Forest Trees of N. A.*, ix., 193. Lemmon in *3d Bienn. Rep. Cal. State Bd. Forestry*, 98; 1st and 2d eds., *Hand-Book West-American Cone-Bearers*, 7 (1892); also in 3d (Pocket) ed. of same, 34. Coville in *Con. to U. S. Nat. Herb.*, iv., 22.

† Picea Engelmanni, Engelm. in part in several publications. Sargent in Xth U. S. Census, *Forest Trees of N. A.*, ix., 205 (1884), in the reference to trees "rare and of small size in the mountains of Montana, Oregon and Washington"; Lemmon in *3d Bienn. Rep. Cal. State Bd. Forestry*, 113, so far as relates to the north-western form.

line; annual branchlets slender, two to three millimetres thick, those on the upper branches clothed in the bearing season with small yellowish, narrowly elliptical cones one and a half to two inches long; the scales thin, obovate, obtuse, with scarious, wrinkled edges, the scale-bracts very small, four to six millimetres long, acute; seeds brown, two to three millimetres long, with convex, obovate, shining wings. Forms a portion of the forests on the mountains of Oregon, Washington, Idaho, Montana and British Columbia, extremely northern and alpine forms being reduced to mere shrubs. The true P. Engelmanni inhabits the mountains of Wyoming, Colorado, Utah, New Mexico and Arizona, and attains a much larger size, often exceeding 130 feet in height, with a diameter of five feet. Bark thick, brown, deeply furrowed; lower and middle branches long, making the tree fusiform in outline; the branchlets robust, three to five millimetres thick; cones elliptical, two to two and a half inches long, brownish, the scales subrhomboid in outline, thicker and firmer than the other species, the scale-bracts four to six millimetres long, truncate or spathulate; seeds and wings comparatively large.

Abies Shastensis, nom nov.*—This, the Shasta Red Fir, often attains a medium size, 100 to 120 feet in height, with a diameter of three to four feet. Bark dark outside, red within, deeply furrowed; foliage less robust than that of the typical Abies magnifica; the cones usually elliptical, with more protuberant scales, the apophyses clothed with short, stiff, recurved, brownish hairs; the scale-bracts usually developed to a great length, extending one-half to one inch from between the scales. Headquarters around the base of Mount Shasta, California, at altitudes of 5,000 to 8,000 feet, forming a large, dense, almost exclusive Fir forest. A few trees are found on neighboring slopes of the Scott, Trinity, Siskiou and the southern end of the Cascade Mountains in Oregon. The true A. magnifica, reported originally from "the high unexplored part of the Sierra Nevada to the eastward of San Francisco," attains a much larger size, often 250 to 300 feet high, with a diameter of eight to twelve feet, its magnificent columnar trunk naked to a height of 100 feet; bark light brown outside, madder-red within, deeply fissured, on the largest trees three to five inches thick; the large purple or yellowish cones are almost cylindrical, truncate; the scale-bracts undeveloped, usually completely concealed. This, the Magnificent, or California Red Fir, inhabits the high Sierra nearly from end to end, usually mingling with other trees, rarely, as in the central portions of the Sierra, it forms almost exclusive forests of exceeding grandeur.

Oakland, Calif. *J. G. Lemmon.*

New or Little-known Plants.

Ribes erythrocarpum.

THIS pretty Ribes was discovered by Dr. F. V. Coville, of the Department of Agriculture, who found it last August in flower in the neighborhood of Crater Lake, in southern Oregon, then a virgin territory for the botanist. At an elevation of about seven thousand feet above the sea, it is comparatively common in the shade of noble trees of Tsuga Pattonii, which here grows to its largest size and forms the principal part of the forest. It was found a month later with ripe fruit in the same locality by members of the Forest Commission of the National Academy of Sciences.

Ribes erythrocarpum† (see illustration on page 185 of this issue) is a trailing, glandular hirsute shrub with elongated, slender, unarmed stems rooting and producing short ascending branches five or six inches in height, rugose orbicular, three to five lobed, coarsely crenate leaves, erect racemes of from ten to twenty flowers with glandular calyx-lobes and broadly spathulate reddish petals and erect subpyriform to spherical bright scarlet fruit about half an inch in diameter and covered with glandular hairs.

In the structure of its flowers Ribes erythrocarpum is closely related to Ribes laxiflorum, from which it is distinguished by its prostrate stems, and glandular hairs which resemble those of Ribes viscosissimum.

The seeds of this Ribes have been sown in the Arnold Arboretum, and it will probably, therefore, be possible to test the value of this pretty and distinct species as a garden plant.

Plant Notes.

Pelargoniums at Cornell University.

THE issue of Garden and Forest for July 25th, 1894 stated that a prize offered the year previous by the Massachusetts Horticultural Society for Pelargoniums did not bring out a single entry. It will be no surprise, then, to learn that of the more than 400 varieties of this beautiful flower now in bloom in the forcing-houses of the horticultural department at Cornell University, very few were obtained from eastern growers. The plants of the Zonal-inquinans races (popularly, Zonal Geraniums, Fish Geraniums, Horseshoe Geraniums, etc.) and the Ivy-leaved Geraniums were almost all furnished by E. G. Hill & Co., of Richmond, Indiana, and W. P. Simmons & Co., of Geneva, Ohio, and the Show and Fancy Pelargoniums from John H. Sievers, of San Francisco, while Geranium fanciers here and there have added to the collection. Botanically, these are all Pelargoniums, but the old name Geranium has clung so persistently to three of the races, namely, the Zonal, the Ivy-leaved and the Rose or Sweet-scented, that until the true botanical name shall have come into general use, one runs less risk of being misunderstood by following the gardeners' nomenclature. Of the varieties at Cornell, more than 300 are Zonal Geraniums, some seventy are gardeners' Pelargoniums (Pelargonium, section Pelargium of Harvey), and 28 are of the Ivy-leaved series.

The Ivy-leaved Geraniums are very graceful trailing plants, with a bright scarlet flower, or one with tints running toward the light red and orange scales. The modern growers show a preference for the double-flowering varieties, following doubtless the demand of the public—a choice fully justified by a comparison of the ample, well-clothed modern flower with the more scantily furnished older type. The ivy-like leaves, the grace of their trailing habit and the pretty flowers make this variety a charming plant for the hanging basket or for any spot where the trailing plant can be used with advantage.

The tradition receives an apparently unanimous assent that all the hundreds, we might say thousands, of varieties of Zonal Geraniums are descended from two parent races —the Pelargonium inquinans and the Pelargonium zonale— imported from the Cape of Good Hope and grown in England as early as 1710 and 1714 respectively. These have been crossed and recrossed with each other and with their descendants to such an extent that a European-cultivated flower can no longer be found that represents either of the parent types. A mixed race has been produced, the Zonal-inquinans. In 1732 there were alive in Sherard's gardens at Eltham, England, six species of Pelargoniums. The first edition of *Le Bon Jardinier*, that of 1773, published at Paris, mentions but three sorts. A recent catalogue of Cannell, the English grower, contains the names of upwards of 700 varieties; one of Bruant (Poitiers, France), upwards of 900; and a little book by H. Dauchenay, published this year at Paris, treating only of the Zonal-inquinans race, contains the names of more than 3,500 varieties, many of which have, of course, disappeared from cultivation.

The type of Geranium best known on this side of the

* Abies nobilis (Lindl.), Engelmann, Brewer & Watson, *Bot. Cal.*, ii., 119 (1880), in part, so far as relates to "the Red Fir of northern California forming large forests about the base of Mount Shasta."

Abies magnifica, Murr., Sargent in Xth U. S. Census, *Forest Trees of N. A.*, ix., 914 (1884), in part.

Abies nobilis, var. magnifica, Masters, *Journ. Linn. Soc.*, xxii., 189 (1887), in part, with pl. 5.

Abies magnifica, var. Shastensis, Lemmon, in *3d Bienn. Rep. Cal. State Bd. Forestry*, 145 (1890); and in 1st and 2d eds. *Hand-book West Am. Cone-Bearers*, 13 (1892); also in 3d (Pocket) ed. of same, 62, with pl. 11 (1895).

† Coville, *Proc. Biol. Soc., Washington*, x., 131 (1896).

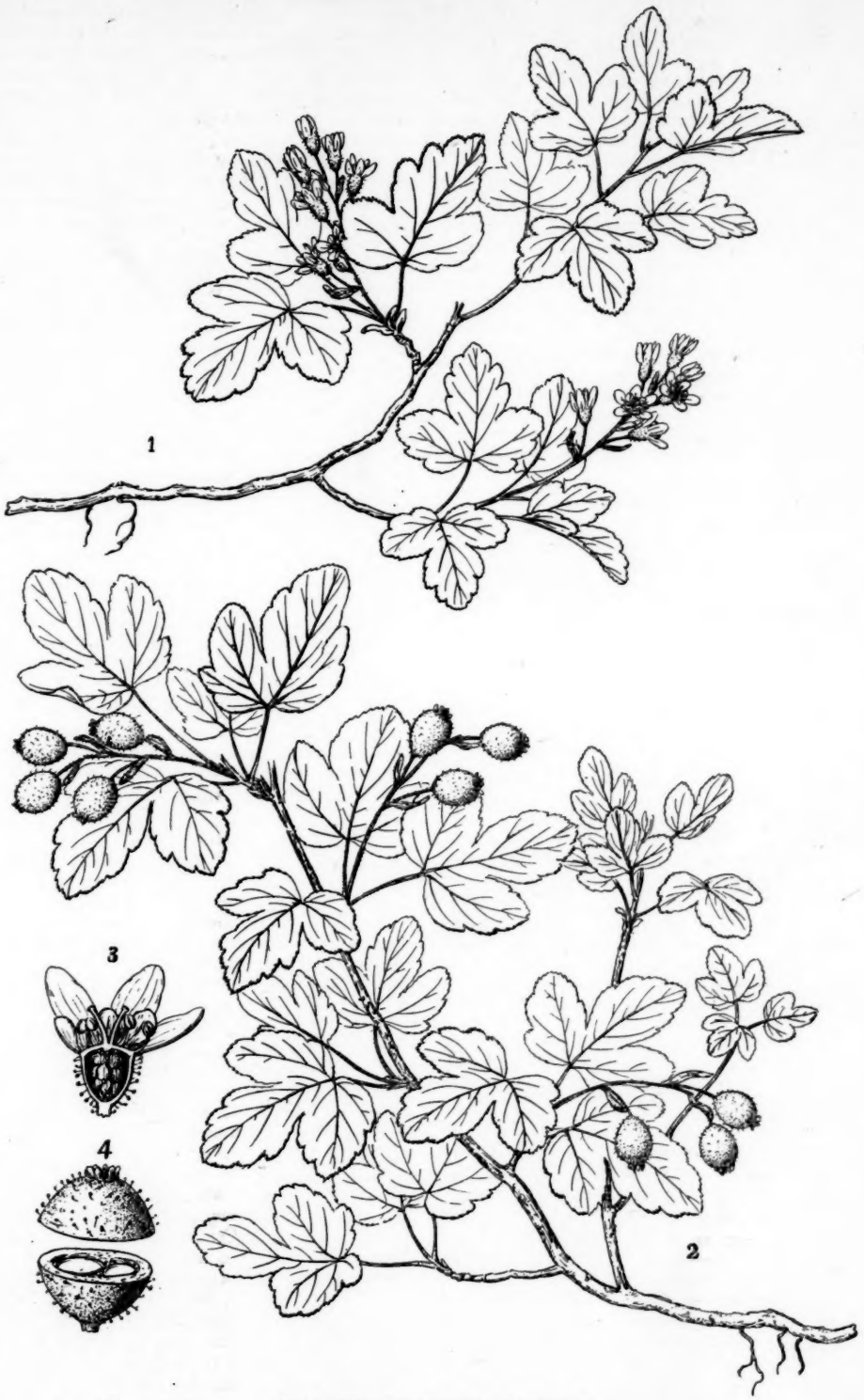

Fig. 21.—Ribes erythrocarpum.—See page 184.

1. Flowering branch, natural size. 2. Fruiting branch, natural size. 3. Vertical section of flower, enlarged. 4. Cross-section of fruit, enlarged.

Atlantic is that of the double-flowering Zonal-inquinans varieties, perhaps on account of their qualities as bedding plants. Here, in accordance with the demands of modern taste, to the old scarlets, often very vivid, have been added, in the coloring of the flower, the lighter tints of red and of orange. In the double-flowered sorts the individual flower loses character, and its importance is absorbed by that of the truss, which, whether large or of medium size, should be copiously and compactly furnished. There seems to be a preference for plants of a dwarf habit. The specimens

grown at Cornell have proved, as a rule, to answer to the descriptions in the catalogues, and intending buyers may be safely directed to them for the choice of the color of flower and habit of plant they prefer. So, too, with the variegated-leaved Zonals, including the bronze Zonals. But few of these latter are included in the Cornell collection. The flowering ones are interesting, in that their flowers are of the primitive, narrow-petaled type, and a comparison of them with the productions of later years furnishes a comparison of the advance made. This consists mainly in the rounding and enlarging of the general form of the single flower and the filling out of the petal, so that now the petals almost completely overlap and the intervening spaces have disappeared.

As early as 1841 *The Gardeners' Chronicle*, of London, in congratulating the public upon the advance already made in the Zonal Geranium, said: "The long, narrow, flimsy petals, moved by every breath of wind and separated to their very base by broad open space, have been succeeded by the beautiful compact flowers of the present day, with broad short petals, so entirely overlying each other as to leave scarcely an indentation in the outline of the flower." The illustration on this page shows the flowers which *The Gardeners' Chronicle* then set before its readers. It has to do, perhaps, with the success of the English growers that they should at so early a period have had before them a distinct ideal. Moreover, it is interesting to note that the English and Continental types tend toward the same ideal of beauty, so much so that Monsieur Dauchenay, in the book already referred to, has to choose other characteristics than those of the flowers to distinguish between certain of the races. If a first place must be given to races, several of which produce such beautiful individuals, it will probably be awarded to the English round-flowered varieties, brought to their present perfection by Cannell, Pearson and other English growers. They are beautiful in the size and symmetry of both truss and individual flower, and especially in the lighter tints of the red and of the orange scales. And yet, if after having looked at a group of these flowers the eye happens to fall upon one composed of the masterpieces of the French growers—Bruant, Lemoine and others—this judgment is apt to be questioned. If we may take the Cornell collection as a fair representative of both, we will say that the English have attained great beauty in the lighter tints, and that the French, while not behind in these, have produced some reds which for depth and brilliancy are superb. There is, by the way, probably no floral subject to which these superlative terms, so much misused, can so often aptly be applied as to the modern Geranium flower.

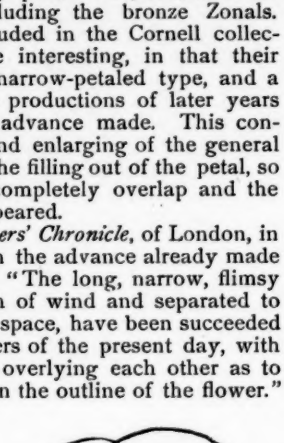

Fig. 22.—The "improved" and "original" forms of Pelargonium flowers as illustrated over fifty years ago in *The Gardeners' Chronicle*.

An interesting introduction of the French are the "Panache," or "splashed" series. In these the various tints of red are underlaid or mixed with white in the most diverse manner, sometimes producing the effect of mere spots of one color or the other, sometimes that of a gradation from a light tint to a deep shade running from the centre to the tip of the flower, or vice versa. An interesting morphological development, and a somewhat uncommon one, is that of the umbellule. A single flower of an umbel is raised above its companions by a stem that has lengthened into a short stalk. As to the symmetry and size of the plants themselves, those in the Cornell collection are too young to allow of safe judgment. As the plants began to flower, a feeling of disappointment was quite general, which can hardly be explained now that it has yielded to one of admiration. Perhaps the long stalks of the flowers shocked at first; perhaps the first colors to develop were the least pleasing. In any case, if there is a fortunate difference in opinion as to the relative beauty of various flowers, there is none as to the beauty of the collection as a whole.

It would be invidious to recommend particular flowers among so many beautiful ones; and, again, the intending purchaser may be sent to the catalogues of the reputable growers for the color and habit of their choice. If the Zonal Geranium is a somewhat formal flower, it cannot be said of the simple-flowering varieties, as it can of the double-flowering sorts, that the individuality of the individual flower has been merged into that of the truss. As to color, the range is not wide, embracing as it does only the scales of red and orange, and running to white; yet, within these limits, it is very rich, offering from a pure white or the mere suggestion of a tint or an iridescence, to the deeper tones of its characteristic lines. Who knows but the Zonal Geranium may sometime become as favorite a flower here as it is in England, whence the London correspondent of Garden and Forest could write a few years ago (Garden and Forest, November 28th, 1894), referring to Mr. Cannell's autumn exhibition of Zonal Pelargoniums: "They are as delightful to look upon as is the return of spring. . . . I question if there is anything in the whole range of garden exotics which has the same all-round value as the race of Scarlet Geraniums"?

Cornell University. *W. S. A.*

Cultural Department.

The Hippeastrums.—III.

HYBRIDS.

IN the days of Dean Herbert many fine hybrids of Amaryllis were raised, which, however, were mostly lost again. About a hundred of these were described and many were figured in the second edition of Sweet's *British Flower Garden* (1830). Dean Herbert, in his excellent work, *Amaryllidaceæ* (1837), enumerates and gives the parentage of thirty-one of the finest hybrids raised by himself and others. The first hybrid of which we have any knowledge is Hippeastrum Johnsonii, raised by Mr. Johnson, an amateur, in 1810, from H. Reginæ and H. vittatum. It is very robust, free-flowering and beautiful, and still the most common of all Amaryllis in cultivation. A lover of Amaryllis usually starts with this one when forming a collection, as it is easily grown, and it is not uncommon for it to flower twice a year. The fragrant, showy flowers, of which four to six are carried on a scape about eighteen inches high, are deep cherry-red, banded with white. Scarcely any other flower is so frequently seen, and in such prime condition, in windows and gardens as this Amaryllis. Its abundant deep green strap-shaped leaves are usually fully developed when the large trumpets open. In the Gulf region it is one of the most common and highly prized garden flowers. It flourishes luxuriantly in the open air as far north as southern Missouri and the City of Washington, but requires a good winter protection of ashes, sawdust or leaves. In the south it forms in a few years large clumps which often produce twenty to thirty flower-scapes at the same time and make beautiful masses of bloom. This robust hybrid is a good example of the survival of the fittest, as all the early weaker-growing kinds were lost soon after their introduction.

Another noteworthy cross still in cultivation is H. Ackermanni, raised in 1835 from H. aulicum platypetalum crossed with H. psittacinum. It is of fine open form and marks a great advance on all its predecessors. A few years later H. Ackermanni pulcherrimum was obtained from H. aulicum, crossed with H. Johnsonii. Its beautiful, symmetrical form and good substance, in addition to its dazzling red color, gave a considerable impulse to the culture of these wonderful bulbous plants.

I have before me three colored plates of Amaryllis published in *Flore des Serres* about forty years ago, each plate showing four different hybrids raised by the late Louis van

Houtte, of Ghent. Although pronounced as the very best Amaryllis of their time they would scarcely attract more than a passing glance to-day. They all show unique and often brilliant colors, but all are characterized by narrow, pointed segments, scarcely broad enough to exclude the light from behind. At the same time Van Eeden took up the cultivation of the Amaryllis with marked success, as his fine hybrids H. Count Cavour and H. Fidelio show.

S. A. De Graaf, of Leyden, Holland, is usually termed the Amaryllis King. He has raised and introduced many thousand exquisite, broad-petaled and finely formed robust-growing hybrids. These plants have been cultivated in the family of Mr. De Graaf since 1790. At first only the species were crossed and intercrossed, and though rich colors were obtained, the flowers were small. The present Mr. De Graaf began to hybridize in 1862. From a fine hybrid named after his family, H. Graveana and H. psittacinum, the very robust and strikingly beautiful Empress of India was raised. This hybrid is of glowing orange-scarlet color, with broad white bands, changing in the tube to a yellowish green. The segments are very broad and the flowers are of gigantic size, measuring about eight inches in diameter. With the appearance of this remarkable hybrid a new era in hybridizing Amaryllis began. All the sorts now sent out by Mr. De Graaf are stately in growth, exceedingly rich in color and of fine form. Bulbs fifteen to eighteen inches in circumference are produced, as a rule, each bulb sending up from two to four flower-scapes, each crowned with four to six flowers. Of the following almost all vie in beauty with Empress of India: Professor Koch, Van Speyk, Jacob Cats, Franz Hals, Laurens Koster, Rubens, President Carnot, Mozart, Louis Pasteur, Willem III. and Surprise. Of the light-flowering hybrids the following are the most beautiful and robust: Elvira, Waterloo, Conqueror and Schiller.

The introduction of H. Leopoldii and H. pardinum afforded an excellent opportunity to Messrs. Veitch & Sons, of Chelsea, England, to attempt the improvement of the beautiful hybrids raised by Mr. De Graaf. In 1867 they raised the very glowing broad-petaled Chelsoni and Brilliant. Unfortunately these forms are weak growers and not easily kept in good health. Later, Mr. John Heal, who is in charge of the great Amaryllis collection of Chelsea, crossed De Graaf's Empress of India with the best forms of Leopoldii, with the result of obtaining not only four to six flowered scapes, but also decided breaks of color into various shades and tints, and from the intercrossing of forms so obtained has resulted the race of Amaryllis now so universally admired. Almost all the named Amaryllis sent out by Messrs. Veitch at present are of the most symmetrical form and as beautiful in every respect as any Lily. I have just now the following in bloom: Crown Princess of Germany, very short-tubed, open, broad-petaled, rosy white clouded with deep glowing red; John Heal, deep red with a yellowish white star and points of segments broadly tipped, creamy white; Milton, Meteor and Enchantress, all of a light color lined and penciled with red; Southey, Star of India and Ne Plus Ultra, all of vigorous growth and bright red color.

A little later Mr. B. S. Williams, of London, also began the hybridizing of Amaryllis, but on an entirely different line. His results are among the best achieved. He succeeded in raising the exquisite Amaryllis, Dr. Masters, a small-flowered but exceedingly gorgeous hybrid, a glowing crimson-scarlet self, without a trace of any other color. This kind is easily grown, and flowers profusely when very small, in the window as well as in the greenhouse. Mr. Williams has also raised robust-growing, large-flowering hybrids, of which Lady Ardilaun, Joseph Chamberlain, Ornata and Magnæflora are fine examples, but he especially excels in the smaller-flowering, symmetrically formed kinds, particularly those flowering in autumn. These have mostly been derived from Hippeastrum reticulata and its progeny, and almost all have short broad leaves, striped with a conspicuous white band. Of these Mrs. Garfield, Mrs. William Lee, Comte de Germiny, George Firth and R. J. Pitcher are the most beautiful now in cultivation.

One of the best Amaryllis cultivators and an excellent writer on the subject is Mr. James Douglas, of Great Gearies, England. He has a fine private collection and has raised a number that rival in gorgeous coloring those obtained by Mr. John Heal, of the Messrs. Veitch. I have quite a number of his kinds in my collection, and all are beautiful. The most noteworthy are Serapis, Clarinda, Cleanthes, Prince Albert Victor, Grand Monarch, Great Gearies, etc. His accounts of these royal plants in the English horticultural journals have done much to disseminate information on the subject, and many flower lovers have been induced by him to take up their cultivation.

Milwaukee, Wis. *H. Nehrling.*

Early-flowering Shrubs.

GARDEN AND FOREST has often called attention to the beauty of the foliage of trees in early spring, not only on account of its delicate texture, but on account of its wonderful color, which is different in every species and sometimes in the individual trees of each species. It often changes between morning and night through a range of color entirely different from that which the same leaves assume in autumn. Of course, these spring tints are not as vivid as those of autumn, but they are quite as rich, and our forests never show more wonderful variety of tone than they do through the hazy air of early May. But I do not remember ever to have seen much stress laid on the varying colors of the foliage of shrubs in spring, although this is almost as beautiful, and it adds one more to the many delightful aspects of the shrub border. For general form, for luxuriant flowering, for variety of foliage, for beauty of fruit in summer and winter, for the depth of the color of its foliage in autumn, much has been written about shrub plantations, but it well may be added that between the middle of April and the last of May the variety of form and color in the leaves of any extensive plantation of shrubs brings a constant delight. The light yellowish green of some of the low Willows, the gray of the Elæagnuses, the dark bronze or deep wine-color of some of the Viburnums with all shades of green between, make a variety which is almost infinite.

This is the flowering season of many shrubs; the very earliest of them, like the Chinese Bush Honeysuckles, Lonicera fragrantissima and L. Standishii, are already past their bloom. So are the Spice-bush, the beautiful Cornelian Cherry, Daphne Mezereum, the Leatherwood, Andromeda floribunda and its Japanese relative. Several of the Currants are still in flower, and among them the western Ribes sanguineum, which is occasionally seen here, though it does not do as well as R. aureum, the well-known Missouri Currant, with its bright golden-yellow flowers. The hybrid R. Gordonianum is very hardy, being a cross between R. aureum and R. sanguineum, and bears flowers abundantly in racemes. There are many other varieties and species of Currant which ought to be in gardens and which are found in collections like the one in the Arnold Arboretum. For example, the American Red Currant, R. rubrum, is a beautiful object when in flower. Out in the swamps the fragrant Andromeda polifolia is in bloom, but it is rarely seen here in cultivation, although it does just as well in a border and flowers as freely as it does when it is in the peat bog where it naturally grows and is sometimes almost entirely submerged in water. The little Swamp Laurel, Kalmia glauca, a low shrub from the far north, is just opening its lilac-purple flowers, and so is the beautiful Rhodora, which is known by Emerson's poem to a very great many people who have never seen its rosy flowers in a cold northern swamp. Rhododendron Vaseyi is showing its clear pink flowers, which are quite unlike either of those of other Azaleas. Many years ago GARDEN AND FOREST recommended the crossing of this plant with the Rhodora. Has any one tried the experiment? The Siberian Pea-tree, Caragana arborescens, and the shrubby C. fructescens, which begins to flower a day or two earlier, are both now showing their bright yellow pea-shaped flowers in clusters from the axils of the leaves. Daphne Genkwa is displaying its tubular flowers with the singular bluish-lilac color which no hardy shrub of the season exactly matches. Spiræa Thunbergii has passed out of bloom, the old-fashioned S. prunifolia is still covered with its double flowers and will soon be followed by half a dozen more, while Exochorda, often called the Pearl Bush, Japan Quinces in variety, Rhodotypus and many others are in full beauty. Among the smaller trees the Red-buds, many of the Plums and a wonderful variety of flowering Apples and Thorns are in full bloom. In short, the shrubbery is never more beautiful than it is in early May.

New Brunswick, N. J. *R. Ennis.*

Orchids in Flower.

THE greenhouse is as gay with flowers in April as in any month of the year, and the Orchid-house quite holds its own, with most of the genera represented. Cattleyas are probably most numerous. Fine forms of C. Trianæ are in flower, and one of the most distinct is the variety Schrœderiana. C. Lawrenciana is bearing some handsome spikes of five and six flowers. C. intermedia, C. Skinneri, C. Mendelii and C. maxima are all in full flower, while the flowers of C. Mossiæ are just pushing through the sheath.

Among Dendrobiums a few flowers of D. nobile still remain, while D. densiflorum and D. thyrsiflorum are just coming to their best. Fine flowers of the fragrant Cymbidium eburneum are still to be seen.

Cypripediums are not so plentifully represented at this season. C. villosum will soon be past its best. C. Lawrencianum is just coming in, and this deservedly popular variety is attractive both in flower and foliage. C. caudatum, or Selenipedium caudatum as it is now classed, is bearing some fine flowers, which, with their long tail-like petals, are more quaint than showy.

The somewhat rare Bifrenaria Harrisoniæ eburnea is bearing its two-flowered spikes of ivory-white flowers. A few flowers of Lycaste Skinneri still linger, though somewhat out of season. This is one of the longest-standing Orchids we have if taken care of, but the least touch disfigures it, and it must, therefore, be carefully handled. Odontoglossum Harryanum is carrying some fine spikes, while the little O. Rossii and its variety O. Rossii majus still produce a few flowers. Oncidium splendidium is just at its best and is bearing noble spikes of richly colored flowers. The flower-spikes of Renanthera coccinea are fast pushing out, and an abundance of bloom is promised. Several varieties of Phalænopsis are still in flower, P. amabilis and P. Schilleriana being most abundant. Schomburgkia undulata still holds its brownish purple flowers in good condition, but they will soon be past their best.

Tarrytown, N. Y. *William Scott.*

Irises.—To continue the calendar of Irises, I. fumosa in mid-bloom now proves to have a flower of a light yellow color more pleasing than I. Caucasica, with a little smokiness, but it is not a very effective garden plant. In foliage and habit it is akin to I. Sindjarensis. The first of the rhizomatous Irises flowered last week. I. rubro-marginata, which I have before described as a very dwarf species with scythe-shaped leaves and small flowers an inch across, dark red-purple, tinged with blue, in color. It has tall and large standards. It is a bearded Iris from Asia Minor. Other Irises now in flower are I. pumila and its white variety, both dwarf kinds, six inches or so in height; also I. Chamæiris, a species growing about a foot high, with pleasing yellow flowers. About the same height is I. Olbiensis, a dark purple-flowering kind, very desirable and effective. Somewhat dwarfer is I. lutescens, with pale yellow flowers and falls slightly tinged with purple; from a garden point of view, an inferior species. Similar in habit and size is I. Statellæ, a species with creamy white flowers and yellow markings on the falls. The color is very pure in tone and the species one of the most desirable. Also at this time flowers I. Tectorum, the Japanese Roof Iris, though it is under protection, and has never been tested for hardiness in my garden. It flowers before it has made much new growth. The flowers are very handsome, with wide falls light lavender in hue, darker markings of the same color. This Iris has a very pretty habit, the sword-like leaves being somewhat relaxed. My plant produces double flowers, if that describes the curvature, which may be its normal form, or otherwise.

Elizabeth, N. J. *J. N. G.*

Correspondence.

Bibliographical Notes on American Trees.—II.

To the Editor of Garden and Forest:

Sir,—In No. 477 of Garden and Forest, Mr. Farwell calls for a more explicit statement of the case of the publication of Abies as a genus by Duhamel in 1755. He credits me with saying that "Duhamel published a genus Abies in 1755," but complains that I "fail to state what his type was." It is true that I did not indicate what was Duhamel's type; but that was not and is not necessary, inasmuch as I did not publish any such ambiguous statement as that Duhamel presented a genus Abies. I said the genus Abies; and that expression implies that the author has the Firs, not the Spruces, for his type. Of course, all early authors included the species of Picea and of Tsuga under Abies, Duhamel with the rest; but they are quite as unanimously accepted the true Firs as the type of Abies. In this Duhamel is even more explicit than some others, for, in characterizing Abies, he states that the more genuine species—the Abies proper—have upright cones, two-ranked foliage, etc. And then, in the enumeration of the species, the common Old World Fir, Abies alba, Mill. (A. pectinata, Lam.), holds the first place, as being the type of the genus.

In attempting to establish the identity of Miller's Abies Canadensis with the Pinus Canadensis of Linnæus, Mr. Farwell has at least presented a curious, if not, indeed, a very difficult problem in nomenclature, though his own way of solving it will not satisfy every one. In the process of his reasoning some important considerations seem to have been left out of view, as, for example, the possibility that both Linnæus and Miller may have had two different trees, perhaps of different genera, included under the specific name Canadensis. For, if it be admitted that Linnæus' descriptive phrase, "foliis solitariis linearibus obtusiusculis submembranaceis," applies to and indicates the Hemlock Spruce, it is more certain that the synonym which he adduces from Miller, and which ends with the character "conis parvis biuncialibus laxis," cannot belong to the Hemlock Spruce; for the cones of this are not "lax," nor are they even one-half of "two inches long"; but this, the essential character, does apply to what Miller calls the "Newfoundland White Spruce Fir." It is quite conclusive, then, that our White Spruce forms a part, at least, of the Pinus Canadensis, Linn., and if the Hemlock Spruce was at all intended by him, under the name P. Canadensis, then his so-called species of that name is made up of two trees of different genera—a situation in which that celebrated author placed himself upon almost every page of the *Species Plantarum*. It is even possible to think that by his P. Canadensis nothing at all but the White Spruce is intended. Miller, a contemporary of Linnæus, a careful botanist, and particularly interested in trees introduced from America into Europe, had not the remotest suspicion that the P. Canadensis of the *Species Plantarum* meant anything but the White Spruce. Linnæus had cited his figure of it, published in 1760, as a type, and he himself in 1768 seems innocently to have returned the compliment by adopting, and giving the first place to, Linnæus' descriptive phrase. If by that phrase anything else than the White Spruce had been intended, Miller was completely unaware of it. And as for the Hemlock Spruce, it is plain that Miller, in naming and publishing it as Abies Americana, believed himself to be naming a tree of which Linnæus had made no mention. When, therefore, it is proposed, as by Mr. Farwell, that the two names, P. Canadensis, Linn., and Abies Canadensis, Mill., must be received as applying to the same species, we are ready to answer: Yes, unless under each name two species are included. But when it is said that both names apply primarily to the Hemlock Spruce, we are obliged to protest, first, that Miller both implicitly and expressly denies that he had such intent; and second, that it remains to be shown that even Linnæus meant, by P. Canadensis, the Hemlock Spruce.

Catholic University, D. C. *Edw. L. Greene.*

Is the White Pine Doomed?

To the Editor of Garden and Forest:

Sir,—I have been interested in the discussion of this question in your columns, and I will leave the scientists to decide whether coniferous forests must ultimately give place to those of deciduous trees. In my experience I have found species of both classes of trees which it seemed to me must fail sooner or later because they are unable to produce seeds of good germinating quality, but the White Pine is not one of these. When I lived in Vermont fifty-nine years ago they were cutting timber on Woodford Mountain, adjoining Bennington, for charcoal. An old Vermonter surprised me by saying that wherever a forest was cut down a new kind of timber was sure to take its place. This was the first time I had heard this statement, though it was by no means the last, and when I asked him where the seed came from he replied that he did not know. White Pines are trees which I have admired more than any others, and I have watched them during all these fifty-nine years. In that period I have traveled among White Pine forests in New England, both Canadas, Michigan and Minnesota, and it never once occurred to me that White Pine was losing its power to reproduce itself from lack of seeds, and while I have planted seeds of this tree and sold them for both the home and foreign market, except in a single instance, I have never found any difficulty in securing all I wanted. In that case I sent to Germany and bought eight hundred pounds of seed that had been shipped from Halifax a few weeks before. My experience is that a White Pine-tree will average a full crop of seed once in three years. One year the tree will be well filled with embryo cones, the second year it will perfect a good crop of seeds, and the third year it forms buds for the next crop. I have seen White Pine-trees cut down in Vermont to clear up a farm, and when I visited the same place forty years later I have found the farm run out, while the few Pines that had been left among the rocks on the mountain side had filled the rough places with saplings and seedlings. Several years ago we had an application from a German seedsman for forty hundredweight of White Pine seeds—that means 112 pounds to the hundredweight and 20,000 seeds in every

pound. A Vermont man secured the order and he is probably shipping from there yet. Around Hanover, New Hampshire, an immense quantity of this seed could be collected, and upon the whole, my experience is that the White Pine is spreading over land where it was not known a century ago.

Many years ago Burnet Landreth wrote to me to say that on some land he owned in Virginia there was a large White Pine-tree which he thought had grown from seed dropped accidentally and this had seeded the land to a wonderful extent all about it. I met with a greater surprise than he did when I went to North Carolina to plant three hundred acres of White Pine on the Vanderbilt estate. Right in the city of Asheville on the hillside stood two White Pines on a steep bank, and these had seeded the long slope with Pines up to twenty feet high, and in several months' leisure I had there I explored a great part of the mountains of western North Carolina and eastern Tennessee, and found White Pines in groups here and there, and in many places in uncultivated hills, and in no instance did I notice a sign of very old or decayed trees.

On our sand dunes where there were hundreds of large trees when I came here fifty-three years ago, straight White Pine logs were used by the settlers to make houses and barns, and the gnarly, stunted trees that were there then still stand and produce seeds freely, and seedlings, too, but these are burned up by fires which run over the ground almost every year. Now, these White Pines in Tennessee and Carolina produce seedlings in wonderful quantity and they are of all ages, while the Tulip-tree, although growing in abundance everywhere, produces very few seedlings, and these are separated by ten or a dozen years of age. We have had samples of seed of the Tulip-tree from Indiana, southern Illinois, Kentucky, Tennessee and North Carolina, and we have never found more than ten per cent. of it of germinating quality. All the while I was at Mr. Vanderbilt's place we could find no seedlings, or, at least, very few in a long ramble, except in one instance where a tree had been broken nearly off at about ten feet from the ground with the top still attached. There we found about a thousand seedlings three years old. Perhaps this experience may help some one in theorizing on this interesting problem.

Waukegan, Ill. *Robert Douglas.*

A Wholesale Market for Cut Flowers.

To the Editor of GARDEN AND FOREST:

Sir,—One of the principal wholesale markets for cut flowers in this city besides the Cut-flower Exchange, on West Twenty-third Street, and the wholesale commission dealers, is the one at the foot of Thirty-fourth Street, on the East River. Here about 150 growers come each morning throughout the year, including Sunday. The first sellers and buyers are on hand as early in the morning as five o'clock, but six o'clock is announced to be the opening hour after June the first. The floor of the second story used for the market measures, perhaps, 100 by 50 feet. Space on counters along the walls and in the middle of two large rooms is let at the monthly rate of sixty-five cents a foot to stockholders of the concern, and seventy-five cents to non-members, four feet being the average space rented. Growers come from fifteen to twenty miles out on Long Island, from College Point, Bayside, Great Neck, Floral Park, Woodside, Newtown and other sections. Germans predominate among the sellers, some of whom have attended these sales since their establishment, about twenty-five years ago, and among the buyers are many Greeks, with English-speaking women and men, who have street-stands and small stores of their own. While most of the customers are of these classes, representatives of some of the best stores in New York and Brooklyn come here for any chance novelties and flowers of specially good quality. These early sales are a convenience to small dealers, who can buy the day's stock and have it on their premises by eight o'clock, before the Cut-flower Exchange and commission men have begun business. The early hours here are, however, a disadvantage during midwinter, when buyers do not find it easy to start out before daylight, and the wholesale markets are thus brought into more direct competition, with the effect of lowering prices here. After April the earlier hours are appreciated, as improved prices indicate. At this time of year the main business is done from six to seven o'clock, when a babel of languages is heard. The stock is brought to town by trolley and train, and is carried in large oblong baskets or in great arm-loads. During the Chrysanthemum season and at Easter, the busiest times of the year, two or three persons are often needed to bring the product of one establishment, but it is astonishing how much is packed into one basket and how tightly the flowers are bunched without showing injury after they are opened up. A large basket, with the enforced capacity of a good-sized trunk, and an armful of ten dozen chrysanthemums or lilies are readily carried by one person. The retail city trade on Saturday regulates the volume of Sunday morning purchases here, but, as a rule, only about one-third as much trade is done then as on week days.

On a visit on Saturday morning, May 8th, a great variety of the cheaper homelike and familiar flowers was noted. Candytuft, long, luxuriant stalks of white Snapdragon, Stocks, Sweet Alyssum, Mignonette, Geranium-leaves, Chinese Narcissus, Narcissus poeticus, Lily-of-the-valley and other bulbous flowers; Forget-me-not, Marguerites, Sweet Peas, Heliotrope, Lilac, Bermuda Lilies, Carnations and hybrid Perpetual Roses were the staple stock. Neat bunches of wild Violets were offered at sixty cents a dozen; attractive bunches of the dainty and fragrant Daphne Cneorum, of about two dozen stems, at $1.50 a dozen; callas at fifty cents a dozen, and the best Harris lilies at the same rate. Only a small percentage of the carnations were of high grade, and while these sold for $1.50 a hundred, $1.00 was a general price, and short-stemmed flowers were offered at fifty cents. The arrangement and display of the flowers showed little of the taste and skill which are seen in the markets where more choice and costly flowers are sold, and had the suggestion of out-of-door flowers from a country garden rather than of flowers grown under glass with the highest art and best appliances. For example, it was not uncommon to see three distinct and conflicting colors of carnations in one bunch of a hundred. To be sure, this variety of kinds in a small quantity made a more salable package to offer to small dealers, and, as the object of the market is to sell flowers, no reasonable fault can be found with want of æsthetic arrangement. The range in quality of roses was most marked, and, besides Perle des Jardins, Bride, Bridesmaid and other similar varieties at a dollar a hundred, included the same sorts at three and four times that amount, and Ulrich Brunner at $1.50 and $2.00 a dozen. There were occasional offerings of the old Lamarque rose at low prices, and considerable quantities of well-grown moss roses at $1.50 a hundred.

Primulas were seen more rarely, and showy Parrot tulips, yellow centaureas, trusses of hydrangeas, branches of flowering Almond, Astilbe, Deutzia gracilis, Genista, double-flowering Peach and Spiræa Thunbergii. Buds of the richly colored Pæonia tenuifolia in their fine foliage made a pleasing effect on the eye, though a quantity of these flowers indoors has a disagreeable odor. Spikes of gladioli were seen once or twice, and of Cymbidium eburneum and a Dendrobium. Funkia, maiden-hair fern, asparagus and smilax were quite abundant, and several dealers sold only remarkably fresh-looking polypody and common brake, Pteris, gathered in the Catskills last autumn. By eight o'clock the last flowers had changed hands and been transferred to the baskets of buyers, and the departing throngs with filled and with empty baskets seemed strangely like those which had arrived a couple of hours before.

New York. *M. B. C.*

Spring Notes from Germantown, Pennsylvania.

To the Editor of GARDEN AND FOREST:

Sir,—I have observed that the color of flowers seems to vary in different years, as if the special qualities of a given season had some influence in this matter. It is noticeable hereabouts that the flowers of the pink Dogwood are of a much deeper color this spring than usual. The foliage of what is known as the Blood-leaved Japanese Maple is also darker than usual, and these small trees were never more striking than they are now. In secluded nooks along the Wissahickon the rocks are all ablaze with the flowers of the Wild Columbine. How can these plants flourish with so little apparent nourishment? They not only grow, but they grow with great thriftiness out of crevices in the rocks where there is scarcely room enough for their roots and where it seems impossible for any soil to enter.

Among our most beautiful trees just now are the Crab Apples of various kinds. The variety known as the Transcendent has especially large white flowers, which are very fragrant, but the flowers of all the varieties are beautiful and abundant; their fruit, too, is ornamental, and much of it is excellent for jellies and the like. The so-called flowering Peaches, too, are particularly beautiful just now, a variety with crimson flowers being specially effective. Lilacs are slower in opening than usual, and this gives an opportunity for Syringa oblata to show its special qualities of earliness, as its flowers expanded in advance of all the forms of Syringa vulgaris by a

full fortnight. Many Crape Myrtle plants in Germantown which were left outside have come through the winter with little or no injury. It is observed that after these plants have passed through one season safely they are less susceptible to injury the next, and appear to increase in hardiness after they have stood out several seasons.

Germantown, Pa. *Joseph Meehan.*

Notes.

During April 305,160 bunches of bananas were sold in New York city, mainly from Port Limon, Aspinwall and Jamaica.

It has been suggested that instead of the present plan of distribution of free seeds by the Government that the Department of Agriculture should issue legal-tender notes which Congressmen could distribute among their constituents, so that each one could purchase the particular kind of seeds or flowers or shrubs or trees he needed. Why not?

Two months ago we noted the first arrivals for the season of apples from Tasmania in the English market, and stated that, perhaps, as many as 100,000 boxes would be shipped to the United Kingdom during the year. That limit has been already passed, and double the amount will probably be received before the season is over, which will not be until well into next month, when apples of the current year from the northern hemisphere will be on sale.

A plot owner in the Cypress Hills Cemetery, Brooklyn, has been awarded damages from the Cemetery Association in the sum of $3,500 by the Supreme Court of this state on suit brought for injuries received from Poison Ivy. The Justice, in charging the jury, held that it was the duty of officials to remove poisonous vines, and on application for a new trial, which was granted, he added that the verdict was a just one and that the plaintiff was entitled to damages.

The British Consul at Naples reports that barley is largely used at Naples in the manufacture of port wine. The grain is malted, after which the port wine bacilli are introduced into the mead, where they multiply abundantly and transform the immature beer into the richest port. After their work is finished a sufficient stock of the microbes is preserved in the laboratory for future use, and the product is then sterilized. The manufacture of a good quality of port from barley mead is certainly a new triumph of science.

Mr. E. P. Powell writes to *The American Agriculturist* that the proper way to treat Dewberries is to cover the plants in winter plentifully with leaves, and then in spring to tie them to stakes, allowing the leaves to lie between the rows, held down, if necessary, with a few shovels of earth or a few poles. The vines in this way are under the same conditions as in a natural state when they grow wild by fences. If they have this opportunity the vines will bear heavily, otherwise the fruit is liable to be only knobs and hard, half-developed berries.

Mr. Fred W. Morse, of the New Hampshire Agricultural Experiment Station, has been examining Canada wood ashes which is sold in that state, and he finds the proportion of potash so low in some of the cheaper grades that it looks as if the quality of the ashes had been deliberately reduced by partial leaching or by mixing leached ashes with dry ashes. Buyers of ashes should look with suspicion on a lot that appears excessively moist, because in such cases the potash is seldom equal to the proportion in average ashes. In the same station it has been found that Paris green is often adulterated with earthy matter, either clay or infusorial earth. Buyers of this important insecticide should use no Paris green which does not bear the trade-mark of well-known and responsible manufacturers.

The Conservator of the Forests in Australia states that there are forty-seven millions of acres in that country upon which useful marketable timber is growing, and that there are six hundred species or kinds of timber trees there. Mr. W. Botting Hemsley, quoting this in *Knowledge*, says that Mr. Ednie-Brown, the Conservator, in his enthusiasm has included many trees that do not yield timber of appreciable commercial value, but if the total is reduced one-half Australia stands in conspicuous contrast with the most richly forested districts of the northern timber regions of the Old World, and rivals the coniferous forests of North America. With all this wealth in variety, almost the only commercially important kinds of Australian timber are the Gum-trees, and there are only about a score of these out of the 135 species spread over the country.

The May exhibition of the Massachusetts Horticultural Society, in Boston, was a delight to many visitors, and it was especially interesting on account of a group of thirty seedling Amaryllises, shown by Mr. Kenneth Finlayson, gardener to Dr. C. G. Weld, of Brookline. These plants had flowered in two years and eight months from the seed, and many of them bore five or six blooms, each of great size and substance, splendid color and first-rate form. Mr. Finlayson well deserves the silver medal which he received. Another silver medal was given to Mr. William Donald, gardener to J. S. Bayley, Esq., for a variety of Dendrobium nobile which resembles Sanderianum, but which has been named Bayleyanum. Boronias and Azaleas of admirable quality were shown, and the Calceolarias were the best ever staged in Boston. Mr. Donald received the prize for these, but the collection of Mrs. B. P. Cheney (Mr. John Barr, gardener) was also admirable. Narcissi and Tulips were shown in first-rate form, and the Streptocarpuses shown by John Barr were of the highest merit. Bonton, the new scarlet Carnation, exhibited by Mr. F. A. Blake, of Rochdale, attracted much attention.

The season for so-called deciduous fruits from California, which include all except the Citrus fruits, began in this city last Friday, May 7th, with the auction sale of thirty-six boxes of cherries, at $1.50 to $5.00 each. The first shipment of cherries was made from Vacaville, California, on April 26th, two weeks later than a year ago. But few California oranges are now arriving, and only four car-loads came here last week, against sixty car-loads and more a week during February and March. The retail fruit-stores make a gay display now. Besides cherries, oranges and grape-fruit, choice bananas and pineapples are shown, and large and luscious field and hot-house strawberries. Among the novelties now offered are peaches from Newport hot-houses, at $1.00 each; hot-house grapes, from the same place, at $4.00 a pound, and small muskmelons, from Boston, at twenty-five cents each. The first watermelons, from Key West, sell for $2.00 each, and with these new-crop products Easter Beurre, Winter Nelis and P. Barry pears are seen; these cost from $1.00 to $1.50 a dozen. No less attractive than the fruits are the celery, mushrooms, asparagus, cucumbers and brilliant and perfectly formed tomatoes shown in the fancy-fruit stores.

The last issue of *The Garden* which has come to hand contains a beautifully colored plate of a variety of Primula obconica, which is really a selected form of the strain known as Grandiflora, with flowers twice as large as those of the species originally introduced, and of a light lilac or lavender color. The note which accompanies this picture states that this species so far has refused all attempts at cross-breeding, and, although the Messrs. Veitch have devoted much time and effort to it, no actual hybrid between P. obconica and any other species has resulted. Seedlings, however, have varied much in size, shape and color, and have improved much under selection. There is an especially beautiful one known as Rosea, the name indicating its special tint, which is said to be a great acquisition. This is really one of the most useful and popular plants which have been introduced in recent years, but care must always be used in handling it on account of the irritation and inflammation caused by its hairy glands. We believe that this fact was first brought to public attention by Garden and Forest, where the unpleasant results from careless handling were described as long ago as May 2d, 1888 (vol. i., p. 118; vol. ii., pp. 94, 154, 286). Sometimes this irritation causes a serious illness, but it can be prevented if the plants are always handled with gloves.

The *Northwestern Lumberman*, in speaking of the great flood in the Mississippi valley, says that the deluge has so far subsided that lumber will soon begin to move northward again over the overflowed region, but much of it will be unfit for shipment because it has been under water and is covered with silt. This dirt-covered material will all need to be cleaned, and this will involve a vast amount of work and expense. Where the cottonwood has been covered with water it will be practically ruined, as the dirt can hardly be washed out of its fuzzy fibres, and the result of this is seen in the fact that the price of this lumber has advanced one dollar a thousand. Lucky manufacturerers whose lumber piles have been above the water will make the most of their advantages, and the effect will be seen in the market for oak and ash as well as for cottonwood. It will be several weeks before logging can proceed in the bottom-lands with the mills restored to running condition. There will be mud everywhere, tramways washed out, bridges and trestles destroyed, so that it will be midsummer before everything can be restored to order, with mills running steadily, and weeks more will elapse before the newly cut lumber is dry enough to ship.